

SILICON-GERMANIUM THIN LAYER SEMICONDUCTOR STRUCTURE
WITH VARIABLE SILICON-GERMANIUM COMPOSITION AND METHOD OF
FABRICATION

ABSTRACT OF THE DISCLOSURE

A SiGe thin layer semiconductor structure containing a substrate having a dielectric layer, a variable composition $\text{Si}_x\text{Ge}_{1-x}$ layer on dielectric layer, and a Si cap layer on the variable composition $\text{Si}_x\text{Ge}_{1-x}$ layer. The variable composition $\text{Si}_x\text{Ge}_{1-x}$ layer can contain a $\text{Si}_x\text{Ge}_{1-x}$ layer with a graded Ge content or a plurality of $\text{Si}_x\text{Ge}_{1-x}$ sub-layers each with different Ge content. In one embodiment of the invention, the SiGe thin layer semiconductor structure contains a semiconductor substrate having a dielectric layer, a Si-containing seed layer on the dielectric layer, a variable composition $\text{Si}_x\text{Ge}_{1-x}$ layer on the seed layer, and a Si cap layer on the variable composition $\text{Si}_x\text{Ge}_{1-x}$ layer. A method and processing tool for fabricating the SiGe thin layer semiconductor structure are also provided.